

Abstract of the Disclosure

A fast convolution method applicable to convolving a signal (indicative of an n -dimensional pattern, where n is greater than or equal to two) with a smooth kernel that can be approximated by a separated-spline kernel, and a system configured to perform such method using software or signal processing circuitry. Unlike Fourier-based convolution methods which require on the order of $N \log N$ arithmetic operations for a signal of length N , the method of the invention requires only on the order of N arithmetic operations to do so. Unlike wavelet-based convolution approximations (which typically also require more arithmetic operations than are required in accordance with the invention to convolve the same signal), the method of the invention is exact for convolution kernels which are spline kernels.